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EXAMINER

LIU, LI

ART UNIT PAPER NUMBER

2613

DATE MAILED: 08/02/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/606,323	MACIOCCO ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Li Liu	2613	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 24 June 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-30 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 06/24/2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>5/30/06, 1/10/05</u> | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Specification***

1. The disclosure is objected to because of the following informalities:
  - 1) Paragraphs [0051]-[0053] and [0057], "FIG. 4A" should be changed to "FIG. 4", and "FIG. 4B" should be changed to "FIG. 5".
  - 2) Paragraphs [0055], "FIG. 5" should be changed to "FIG. 6".
  - 3) Paragraphs [0056], "A block 51" should be changed to "A block 601".
  - 4) Paragraphs [0057], "A block 53" should be changed to "A block 603".
  - 5) Paragraphs [0058], "A block 55" should be changed to "A block 605".
  - 6) Paragraphs [0059], "A block 57" should be changed to "A block 607".
  - 7) Paragraphs [0060], "A block 59" should be changed to "A block 609".Appropriate correction is required.
2. The disclosure is objected to because it contains an embedded hyperlink and/or other form of browser-executable code (paragraphs [0090], [0091], [0094] and [0101]). Applicant is required to delete the embedded hyperlink and/or other form of browser-executable code. See MPEP § 608.01.

### ***Claim Rejections - 35 USC § 101***

3. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.
4. Claims 25-30 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

In claim 25, a machine-readable medium is being claimed. Applicant's specification provides that a machine-readable medium can include propagated signals such as electrical, optical, acoustical or other form of propagated signals (e.g., carrier waves, infrared signals, digital signals, etc.) ([00131]). As such, the claims 25-30 do not fall under statutory subject matter.

***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

6. Claims 1-9 and 11-30 are rejected under 35 U.S.C. 102(e) as being anticipated by Ozugur et al (US 2003/0189933).

1) With regard to claim 1, Ozugur et al disclose a method for establishing a coarse-grained reservation of a lightpath traversing a plurality of lightpath segments coupled between nodes in an optical switched network (Figure 1 and Figure 4), comprising:

passing a resource reservation request containing a generalized multi-protocol label-switching (GMPLS)-based label to each of the nodes traversed by the lightpath (Figure 3, Figure 4A and Figure 6, [0013], [0046], Figure 6 displayed how the request is

established [0063]-0068], the signaling for setting up can be done using Label Distribution protocols (LDPs) or Resource Reservation Protocols (RSVPs)), the GMPLS-based label identifying a lightpath segment (In Figure 1, GMPLS Label X identifies lightpath between Edge node 104 and Switching node A, GMPLS Label Y identifies lightpath between Switching node A and Switching node B etc.) to which each node is coupled ([0007], [0011], [0013] and [0014], the signaling for setting up can be done using Label Distribution protocols (LDPs) or Resource Reservation Protocols (RSVPs), Figure 6 shows the segment reservation); and

reserving each of the of lightpath segments for a scheduled timeframe with a respective lightpath segment reservation (Figure 6, [0046], [0063]-[0068], and Ozugur et al also teach the time slot-based OBS in [0069]), each lightpath segment reservation referencing its corresponding lightpath segment using data contained in the GMPLS-based label ([0013] and [0014], Figure 1 and Figure 6, GMPLS Label X identifies lightpath between Edge node 104 and Switching node A, GMPLS Label Y identifies lightpath between Switching node A and Switching node B etc, Figure 6 also shows the segment reservation).

2) With regard to claim 2, Ozugur et al disclose wherein the optical switched network comprises a photonic burst switched (PBS) network (Figure 1, [0007], PBS is a kind of OBS).

3) With regard to claim 3, Ozugur et al disclose wherein the optical burst switched network comprises a wavelength-division multiplexed (WDM) PBS network (Figure 3 shows WDM link, [0045]).

4) With regard to claim 4, Ozugur et al disclose wherein the GMPLS-based label includes an input fiber port field identifying an input fiber port of a node at a receiving end of the lightpath segment identified by the GMPLS-based label ([0044], a GMPLS Routing Engine "GMRE" is used to select fiber link, therefore, an input fiber port field must be in the label, and [0046] a Label\_Set object is used to set up the path).

5) With regard to claim 5, Ozugur et al disclose wherein the GMPLS-based label includes at least one field identifying an input wavelength employed for carrying signals over the lightpath segment identified by the GMPLS-based label (Figure 5, WAVELENGTH\_SET object).

6) With regard to claim 6, Ozugur et al disclose wherein the input wavelength is defined by a value stored in the IEEE standard 754 single precision floating point format (Figure 5, the WAVELENGTH\_SET is 32-bit word).

7) With regard to claim 7, Ozugur et al teach the GMPLS-based label includes a wavelength field (Figure 5). Although Ozugur et al do not explicitly disclose a channel spacing field to store a channel spacing value, Ozugur define a WAVELENGTH\_SET object. Since knowledge of all wavelengths is equivalent to know the channel spacing value, so is the channel spacing field.

8) With regard to claim 8, Ozugur et al disclose wherein the method is performed by:

selecting a selected lightpath route (FIG. 4A, [0043]-[0046]) comprising a plurality of lightpath segments (408a, 408b and 408c in FIG. 4A), coupled between the plurality of nodes (402, 404A, 404B and 406 in FIG. 4A), said lightpath route beginning with a

source node (402 in FIG. 4A) and ending with a destination node (406 in FIG. 4A) and including at least one switching node (404A and 404B in FIG. 4A) between the source and destination nodes;

traversing lightpath segments on the selected lightpath route ([0044], 412b-412a -412a are selected in Fig. 4A);

generating a GMPLS-based label for each lightpath segment ([0046]); and

employing that GMPLS-based label for a corresponding lightpath segment to reserve that lightpath segment for the scheduled timeframe ([0044], a GMPLS Routing Engine "GMRE" is used to select fiber link, [0046] a Label\_Set object is used to set up the path).

9) With regard to claim 9, Ozugur et al disclose wherein the method includes:

determining, at each node along the selected lightpath route, whether the lightpath segment received at that node and a corresponding network resource are available for use during the scheduled timeframe ([0025], GMRE selects the fiber link, [0064] and [0069], Figure 6 shows the procedure of request); and

reserving a network resource for a given lightpath segment for the scheduled timeframe if it is available (FIG. 6 describes the setup procedure for establishing the network), otherwise providing indicia to the source node to indicate the network resource for the given lightpath segment is unavailable for the scheduled timeframe (Figure 6, A RESV message will be send to source node for the reservation, and PathErr or ResvErr message are used for unavailable node [0050] and [0063]).

10) With regard to claim 11, Ozugur et al disclose wherein the method includes:

performing a forward traversal of the selected lightpath route from the source node to the destination node (Figure 6, Edge Router 602 issues a Generalized Label Request and a Path message to Node 1, then similar requests are passed from Node 1 to Node 2 and Node 3 and finally to Egress Router 624);

determining, at each node along the forward traversal, whether the lightpath segment received at that node is available for use during the scheduled timeframe (GMRE selects the fiber link, Figure 6 shows the request, and a RESV is sent back for completion of the reservation); and

temporarily reserving a network resource for a given lightpath segment for the scheduled timeframe with a soft reservation if it is determined to be available (Figure 6, Request starts from Edge Router 602 and end at Egress Edge Router 624, and RESV is sent back from 624 to 602, then "Finally, the path and SWGs at each hop are established for the LSP, as indicated by a path designated by the reference numeral 640" [0068], and Ozugur disclose some control algorithms, such as URMP etc, for the reservation and switching, so it can be interpreted as the soft reservation);

determining if all of the lightpath segments along the selected lightpath route and network resources are available for use during the scheduled timeframe (GMRE selects the fiber link, Figure 6 shows the request, and a RESV is sent back for completion of the reservation); and

committing the soft reservations for each lightpath segment if it is determined that all of the lightpath segment network resources are available for use during the scheduled timeframe (Figure 6 shows the request, and a RESV is sent back for



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completion of the reservation, and "the path and SWGs at each hop are established for the LSP, as indicated by a path designated by the reference numeral 640" [0068]).

11) With regard to claim 12, Ozugur et al disclose wherein the soft reservation are committed by:

performing a reverse traversal of the selected lightpath route from the destination node back to the source node (Figure 6 illustrates the set-up procedure in an OBS network, and a RESV 628 is sent back from Egress Edge Router 624 to Node 3, and then RESV 630 from Node 3 to Node 2, and finally RESV 638 from Node 1 to Ingress Edge Router 602);

setting the soft reservation corresponding to a given lightpath segment to a hard reservation as the node corresponding to that lightpath segment is encountered during the reverse traversal (Ozugur disclose some control algorithms, such as URMP [0074] etc, for the reservation and switching, so it can be interpreted as the soft reservation. During the RESV is sent back from Egress Edge 624 to the Ingress Edge 602, the path at each hop is established for the LSP, so to set the soft reservation to a hard reservation).

12) With regard to claim 13, Ozugur et al disclose wherein data corresponding to the reservation of the lightpath is stored in a reservation lookup table (Routing Table in FIG. 3), the method further comprising:

sending a control burst, during a given timeframe, across the optical switched network from a source node to a destination node (Figure 2, a control packet 202 is

transmitted via separate sets of channels 208 from edge node 210 to destination node);  
and

looking up, in the reservation lookup table, appropriate lightpath segments via which the control burst is to be routed to traverse a lightpath linking the source and destination nodes based on lightpath segment and resource reservations corresponding to the given timeframe (FIG. 3, [0011]-[0013], Control Channel Group (CCG) links are used for routing the control burst, a GMPLS control plane provide network planners, and uses labels associated with burst packet).

13) With regard to claim 14, Ozugur et al disclose a switching apparatus (Figure 3) for use in an optical switched network, comprising:

optical switch fabric (Optical Switch 302 in Figure 3), having at least one input fiber port (Data Channel Group in Figure 3) and at least one output fiber port (Data Channel Group at DataOut in Figure 3); and

a control unit (304 in Figure 3), operatively coupled to control the optical switch fabric, including at least one processor (Control Packet Processing in Figure 1) and a storage device operatively coupled to said at least one processor containing machine-executable instructions, which when executed by said at least one processor perform operations (Figure 3, Ozugur et al disclose that a switch control unit and Routing Table and Wavelength Allocation Table et al are used for setting up a path, Figure 3, therefore a storage device must be used to store the control instructions and tables et al),  
including:

receiving a resource reservation request from a first node (402 in Figure 4A or 602 in Figure 6, [0043]), said resource reservation request including a first generalized multi-protocol label-switching (GMPLS)-based label identifying a first lightpath segment between the first node and the switching apparatus (GMPLS Label X etc in Figure 1), which comprises a second node (404A in Figure 4A or 606 in Figure 6); and

scheduling a coarse-grained time-reserved use of the first lightpath segment for subsequent transmission of data via the first lightpath segment (408a in Figure 4A or 602 to 606 in Figure 6, [0043]).

14) With regard to claim 15, Ozugur et al disclose wherein execution of the instructions further performs the operations of:

creating a second GMPLS-based label identifying a second lightpath segment (408b in Figure 4A, [0043], or from 606 to 608 in Figure 6) between the switching apparatus and a third node;

replacing the first GMPLS-based label in the resource reservation request (Label\_Set changed from one node to another node in Figure 6); and

forwarding the resource reservation request to the third node (Figure 6, Request is passed from one node to another node).

15) With regard to claim 16, Ozugur et al disclose wherein the optical switched network comprises a photonic burst switched (PBS) network ([0007], PBS is a kind of OBS).

16) With regard to claim 17, Ozugur et al disclose wherein the optical switched network comprises a wavelength-division multiplexed (WDM) PBS network (WDM Link

in Figure 3); and the optical switching fabric provides switching of optical signals comprising different wavelengths carried over common fibers that may be respectively coupled to said at least one input fiber port and said at least one output fiber port (Figure 3 and Figure 4B, each fiber is wavelength multiplexed).

17) With regard to claim 18, Ozugur et al disclose wherein the first GMPLS-based label includes an input fiber port field identifying an input fiber port of the switching apparatus corresponding to an end of the first lightpath segment ([0044], a GMPLS Routing Engine "GMRE" is used to select fiber link, therefore, an input fiber port field must be in the label, in [0046] a Label\_Set object is used to set up the path).

18) With regard to claim 19, Ozugur et al disclose wherein the first GMPLS-based label includes at least one field identifying a wavelength employed for carrying signals over the first lightpath segment (Figure 5, WAVELENGTH\_SET object).

19) With regard to claim 20, Ozugur et al disclose wherein the input wavelength is defined by the IEEE standard 754 single precision floating point format (Figure 5, the WAVELENGTH\_SET is 32-bit word).

20) With regard to claim 21, Ozugur et al teach first GMPLS-based label includes a wavelength field. Although Ozugur et al do not explicitly disclose a channel spacing field to store a channel spacing value, Ozugur define a WAVELENGTH\_SET object. Since knowledge of all wavelengths is equivalent to know the channel spacing value, so is the channel spacing field.

21) With regard to claim 22, Ozugur et al disclose wherein execution of the instructions further performs the operation of storing a time-reserved use of the first

lightpath segment that is scheduled in a reservation table maintained by the switching apparatus ([0069], a slot-based OBS is disclosed by Ozugur, and then a SLOT\_SET is used in the label, so it is time-reserved use of the lightpath).

22) With regard to claim 23, Ozugur et al disclose wherein said at least one processor includes a network processor ([0012], a GMPLS control plane provides network planners).

23) With regard to claim 24, Ozugur et al disclose wherein said at least one processor further includes a control processor (304 in Figure 3, a control processor must be in the control unit).

24) With regard to claim 25, Ozugur et al disclose a machine-readable medium to provide instructions (Ozugur et al disclose that a switch control unit and Routing Table and Wavelength Allocation Table et al are used for setting up a path, Figure 3, therefore a machine-readable medium must be used to store the control instructions and tables et al), which when executed by a processor in a switching apparatus comprising a first node in an optical switched network, cause the switching node to perform operations comprising:

receiving a resource reservation request from a second node (608 Node 2 receives request from Node 1 in Figure 6), said resource reservation request including a first generalized multi-protocol label-switching (GMPLS)-based label identifying a first lightpath segment (GMPLS Label Y etc in Figure 1 or Generalized Label Request in Figure 6) between the second node and the switching apparatus; and

scheduling a coarse-grained time-reserved use of the first lightpath segment (412a in Figure 4B, [0043]) for subsequent transmission of data via the first lightpath segment.

25) With regard to claim 26, Ozugur et al disclose wherein execution of the instructions further performs the operations of:

creating a second GMPLS-based label identifying a second lightpath segment (412a in Figure 4A, or from 608 Node 2 to 614 Node 3) between the switching apparatus and a third node;

replacing the first GMPLS-based label in the resource reservation request (Label\_Set changed from one node to another node in Figure 6); and

forwarding the resource reservation request to the third node (Figure 6, Request is passed from one node to another node).

26) With regard to claim 27, Ozugur et al disclose wherein the optical switched network comprise a wavelength-division multiplexed (WDM) photonic burst switched (PBS) network (WDM Link in Figure 3, [0007], PBS is a kind of OBS).

27) With regard to claim 28, Ozugur et al disclose wherein the first GMPLS-based label includes an input fiber port field identifying an input fiber port of the switching apparatus corresponding to an end of the first lightpath segment ([0044], a GMPLS Routing Engine "GMRE" is used to selects fiber link, therefore, an input fiber port field must be in the label, in [0046] a Label\_Set object is used to set up the path).

28) With regard to claim 29, Ozugur et al disclose wherein the first GMPLS-based label includes at least one field identifying a wavelength employed for carrying signals over the first lightpath segment (Figure 5, WAVELENGTH\_SET object).

29) With regard to claim 30, Ozugur et al disclose 30 wherein execution of the instructions further performs the operation of storing a time-reserved use of the first lightpath segment that is scheduled in a reservation table maintained by the switching apparatus ([0069], a slot-based OBS is disclosed by Ozugur, and then a SLOT\_SET is used in the label, so it is time-reserved use of the lightpath).

### ***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ozugur et al (US 2003/0189933) in view of Comellas (*IEEE Network* March/April 2003 page 22-27).

Ozugur et al disclose all of the subject matter as in claim 8 above, and Ozugur et al also teach: determining, at each node along the selected lightpath route, whether the lightpath segment received at that node is available for use during the scheduled timeframe ([0025], GMRE selects the fiber link, [0064] and [0069], FIG. 6 describes the setup procedure for establishing the network); and reserving a given lightpath segment

for the scheduled timeframe if it is available (Figure 4A and Figure 6, [0043]), otherwise providing indicia to the source node to indicate the given lightpath segment is unavailable for the scheduled timeframe (Figure 6, A RESV message will be send to source node for the reservation, and PathErr message is used for unavailable node [0050]).

But Ozugur et al do not disclose wherein the method further comprising:  
selecting a second selected lightpath route.

However, Comellas et al teach a method to select a second selected lightpath route (Figure 1, page 23 IP/WDM Grooming Example Connection).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the method taught by Comellas et al to the method of Ozugur et al so that the network is more flexible, and any fault or contention can be quickly resolved.

### ***Conclusion***

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

Qiao (US 6,956,868, and Labeled Optical Burst Switching for IP-over-WDM Integration, IEEE Communications Magazine September 20, 2000, page 104-114) discloses a labeled optical burst switching for IP-over-WDM integration.

Liu (US 2002/0154360) disclose a discrete time sequence model for slotted switching of OBS.



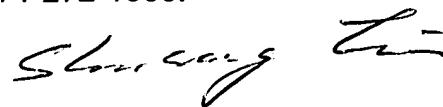
Banerjee et al disclose a generalized multiprotocol label switching (Generalized Multiprotocol Label Switching: An Overview of Routing and Management Enhancements, IEEE Communications Magazine January, 2001, page 144-1150).

Kim et al disclose a GMPLS-based WDM optical network (Discrete Event Simulation of the DiffServ-over-MPLS with NIST GMPLS Lightwave Agile Switching Simulator (GLASS), Joint Conference of Communication and Information-2002, Jeju, Korea).

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Li Liu whose telephone number is (571)270-1084. The examiner can normally be reached on Mon-Fri, 7:30 am - 5:00 pm, alternating Fri off..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shuwang Liu can be reached on (571)272-3036. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



SHUWANG LIU  
SUPERVISORY PATENT EXAMINER